UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD '84 JUL 18 A11:39

In the Matter of	)	
	)	Docket No. 50-322-OL-4
LONG ISLAND LIGHTING COMPANY	)	(Low Power)
	)	
(Shoreham Nuclear Power Station, Unit 1)	)	

TESTIMONY OF JAMES W. CLIFFORD

Q.1. By whom are you employed, and what is the nature of the work you perform?

A.1. I am employed as an Operational Safety Engineer in the Procedures Section of the Procedures and Systems Review Branch, Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission. A Statement of Professional Qualifications, which includes the nature of the work that I perform, is attached.

Q.2. What is the subject matter of your testimony?

A.2. I will address the implementation of the procedures for restoring AC power using the augmented electric power system in the event of a station blackout at the Shoreham Nuclear Power Station.

Q.3. Are operator actions necessary to restore emergency AC power to the Shoreham site?

A.3. Operator actions may be necessary to restore emergency AC power to the Shoreham site, depending on the operation of the installed equipment.

Q.4. Describe the conditions under which operator action is necessary to restore emergency AC power, and briefly describe these actions.

A.4. The postulated scenario for my evaluation was a loss of off-site power with a subsequent postulated failure of various backup power sources to provide power.

The operators are expected to observe operation of automatic equipment, which in the case of loss of off-site power would be the automatic start of the TDI diesel generators and the automatic start of any necessary loads on the emergency buses. If the TDI diesel generators fail to start, or if any necessary loads fail to sequence onto the emergency buses, the operators would be expected to manually start these components.

If the TDI diesel generators could not be started, the operators would be expected to line up the on-site 20 MW gas turbine, or, in conjunction with the system operator, line up an alternate off-site power source, to provide power to the emergency buses. This would involve verification of the availability of either the 20 MW gas turbine or an alternate off-site power source, local operation of a breaker to line up either of these power sources to the 4 KV buses, and manual resetting of the emergency bus program lockout devices.

If these electrical power sources cannot be used, the operators would be expected to line up the temporary EMD diesel generators to the emergency buses. This would involve isolating the 4 KV buses from the Reserve Station Service Transformer (RSST) and the Normal Station Service Transformer (NSST) and shedding the loads from the 4 KV emergency buses. An operator is expected to remove undervoltage bus program fuses locally,

and to verify locally operated breakers are lined up in preparation for power restoration. The NSST may be locally isolated from the emergency buses if a fault exists in the NSST. The local operator is then instructed to close a breaker to connect the EMD diesel generators to the 4 KV buses. The control room operators are then expected to manually load any necessary equipment onto the emergency buses, according to existing plant conditions.

Q.5. Has LILCo developed procedures that provide instructions for the operators to implement these actions?

A.5. Yes.

Q.6. Have you reviewed these procedures?

A.6. Yes.

Q.7. Could you briefly describe the procedures?

A.7. The procedures that I reviewed are SP 29.015.02, "Loss of All AC Power Emergency Procedure" and TP 29.015.03, "Restoration of AC Power With Onsite Mobile Generators Interim Emergency Procedure (5% Power)." SP 29.015.02 provides the actions to take for a station blackout condition, which is the loss of all AC power on the site. It covers the maintenance of plant safety functions and the control of DC powered equipment to prolong battery life. In addition, this procedure provides actions to start the TDI diesels.

TP 29.015.03 contains the actions to be taken in the event of failure of the TDI diesel generators, all alternate off-site power sources, and the on-site 20 MW gas turbine generator. The procedure specifies action steps to accomplish the operations that were outlined in the response to Question 4.

Q.8. Have the operations that are necessary to restore power with the on-site 20 MW gas turbine and the temporary EMD diesel generators been performed to demonstrate that the operators are capable of taking the necessary actions?

A.8. Yes. I observed a demonstration of the operation of both the 20 MW gas turbine and the temporary EMD diesel generators on July 2, 1984, at the Shoreham site. The demonstration included the operator actions that are necessary to restore electrical power and subsequently restore necessary equipment using the 20 MW gas turbine and the temporary EMD diesel generators as electrical power sources.

Q.9. Are the operators capable of implementing the necessary procedures in a timely fashion?

A.9. The operators that conducted the demonstration completed the necessary actions to restore AC power to the emergency buses with the 20 MW gas turbine in approximately 4 minutes. AC power was restored to the emergency buses using the temporary EMD diesel generators in approximately 9 minutes. Upon completion of training of all shift operators on the necessary actions, which we are requiring to include actual performance of the necessary actions to restore power to the emergency buses, there is reasonable assurance that the operators at Shoreham will be capable of implementing the necessary actions well within the minimum required time of 55 minutes as shown in the accident analysis.

PROFESSIONAL QUALIFICATIONS

JAMES WILLIAM CLIFFORD

My name is James William Clifford. I am employed as an Operational Safety Engineer in the Procedures and Systems Review Branch, Division of Human Factors Safety, Office of Nuclear Reactor Regulation, U. S. Nuclear Regulatory Commission, Washington, D. C. I have held this position since October 1980. I have also been assigned as Acting Section Leader, Section A (Procedures) of the Procedures and Systems Review Branch for the period of March 28, 1983 to September 11, 1983. The Procedures and Systems Review Branch reviews and evaluates licensee programs for the technical, human factors, and operational aspects of nuclear power plant operating and maintenance procedures. I was involved in the pre-licensing audit of emergency operating procedures at five (5) applicants' sites, and have review the emergency operating procedure development programs for eight (8) applicants and operating reactors. These reviews included the evaluation of technical guidelines, operational concerns, and the human factors guidelines to be used in the development and implementation of the emergency operating procedures. I was involved as one of the principal staff reviewers for the human factors aspects of emergency operating procedure generic technical guidelines for B&W and Combustion Engineering Owners Group guidelines, and, through the reviews of procedures for three (3) BWR applicants, assisted in the evaluation of the adequacy of the BWR Owners Group guidelines. I was the principal reviewer for the operational and human factors concerns for the Pressurized Thermal Shock generic issue, including audits of emergency operating procedures for six plants.

From July 1978 to October 1980, I was a naval officer qualified to the equivalent of a shift supervisor at the naval nuclear power prototype at Windsor, CT, where my responsibilities included supervision of plant operations, training of new personnel, and ensuring the continued expertise of experienced personnel. From March 1976 to July 1978 I was a naval officer assigned to a nuclear powered ship, where my responsibilities included safe operation of the ship's nuclear power plant.

I earned a BS degree in Systems Engineering from the U. S. Naval Academy in 1974. During my naval service and my employment with the NRC, I have attended several courses, varying from one week to six months in duration, on plant engineering, human factors, and plant operations. I am previously qualified as Chief Engineer Officer for Naval Nuclear Propulsion Plants.